

A Delivery System for the Project Planning and Feasibility/Site Development Course

Svetlana Olbina, Ph.D.

Rinker School of Building Construction
University of Florida
Gainesville, FL

The Project Planning and Feasibility/Site Development course in the Building Construction program includes the nomenclature and process of developing residential real property. This capstone course covers material related to market study, site selection and site analysis, project feasibility analysis, site design, design of houses, estimating, scheduling, financing, and project closeout. By completing this course, students get an overall understanding of the land development process. This paper explains a delivery system used by a new instructor of the existing course. The course methodology encourages students to develop self-learning, critical thinking, communication skills, and teamwork abilities. The course overview, objectives, and methods, such as lectures, guest speakers, a semester capstone project, field trips, and instructor assessment of students, are presented in the paper. The students' evaluations of the course delivery system are given in the paper.

Keywords: residential real estate development, self-learning, teamwork, critical thinking, students' evaluations

Introduction/Literature Review

The Project Planning and Feasibility/Site Development course was created to introduce students to the nomenclature and process of developing real property. The goal of the course is to help students understand the principles and practices of residential land development. This course is also a capstone course for the senior students in the residential track of the building construction program. Graduate students from the Real Estate program in the College of Business also take this course as an elective part of their curriculum.

“Including real estate development in construction curricula would be particularly beneficial in preparing students for entry into the construction industry by understanding the course of events occurring prior to and after the construction phase.” (Holley, 2004) It is important to introduce building construction students “to the related building issues outside traditional construction management.” (Kennedy, 1993) However, real estate principles need to be taught differently to the building construction students because they are not studying to become real estate professionals. Building construction students need to get an understanding of the real estate process. On the other hand, graduate students from a Real Estate Program need to get an understanding of the construction process. As a result, the Project Planning and Feasibility/Site Development course needs to cover multidisciplinary material relevant for both the building construction students and real estate students.

Also, “students are trained in their discipline with only limited knowledge of how others perform their work, or what information others need to accomplish their work tasks.” (O'Brien et al.,

2003) Understanding the land development process results in students' appreciation of all disciplines involved in the real estate process. Nowadays, the real estate and construction industries prefer a construction graduate with knowledge of real estate principles. (Holley, 2004) This course provides building construction students with the necessary real estate vocabulary to intelligently converse with parties involved in the real estate project and helps bring the project to fruition. (Holley, 2004) The course also provides real estate students with needed construction vocabulary.

Since this course is also an integrated capstone course for building construction students, they need to be exposed to the "total building process". (Kennedy, 1993) By conducting a semester real-life project, students are involved in all phases of the real estate process: market study, site selection and site analysis, project feasibility analysis, site design, design of houses, estimating, scheduling, financing, and project closeout.

This course stresses "participatory learning and creative problem solving". (Mills et al., 1996) Students must "learn to learn and, more importantly, learn to think". (Hendley, 1996) Students need to learn how to teach themselves by applying knowledge. (Kirk, 1999) This course encourages creative thinking and active learning. In this course, students work in teams, and "learn by teaching each other". (Mills et al., 1996) Working on group projects instead of on individual projects provides students with an opportunity to build teamwork and communication skills. (O'Brien et al., 2003)

Course Overview

The Project Planning and Feasibility course is a required senior level course for building construction students in the residential track. The course titled Site Development covers the same material and is taught at the same time as the Project Planning and Feasibility course. The Site Development course is an elective course for Real Estate graduate students. The course covers material related to residential real estate development. This includes basic library and computer research techniques, demographic analysis of census data, market analysis and capture ratios, the political review process, design development and engineering, conceptual cost estimates, and the cash flow associated with the analysis of financial feasibility.

The course has the following objectives for students:

- To comprehend the complexity and multidiscipline aspects of the land development process.
- To appreciate all parties involved in the land development process.
- To understand the total building process.
- To become construction professionals with good general knowledge.
- To create a real-life situation for the site development project by simulating professional practice.
- For building construction students: To develop real estate vocabulary.
- For real estate students: To develop construction vocabulary.
- To build teamwork abilities, communication skills, and leadership skills.
- To become critical thinkers and self-learners.

Course Methods

The delivery system described in this paper was implemented in the Fall 2005, Spring 2006 and Fall 2006 semesters. The class usually has between 12 and 20 students enrolled, so the class is held at the same time/place for both undergraduate and graduate students. The class meets twice weekly for two hours. The class is a lecture/lab format worth three credit hours, with approximately fifty percent lecture-based, and fifty percent lab. Both lectures and labs were taught by the instructor. The following teaching methods were used in the class: lectures, guest speakers, a series of assignments that formed the semester capstone project, students' presentations, and field trips.

Lectures

The lectures consist of a presentation and discussion of the topics related to the real estate principles. The instructor introduces students to the concepts to which they have not been exposed in their previous education. These concepts include: land development process, project feasibility analysis, site selection, site analysis, site engineering, sustainable site development, market study, and sales and marketing. Material taught in other building construction courses that is necessary in the capstone course is only briefly refreshed. This material includes: site design, design of single-family homes, estimating and scheduling of the residential project, financing development, construction contracts, and project closeout.

The lecture material is presented in Power Point, and all lecture slides are posted on the course website so that students can refer to this material when needed. Students apply the concepts learned during the lectures in the semester project assignments.

The required textbook for the course is by Kone Linda titled, *Land Development*, 9th edition, National Association of Home Builders, Home Builders Press, 2000.

Guest Speakers

Since this is the multidisciplinary course, it is very beneficial for the students and helpful for the instructor to invite guest speakers from the industry. Guest speakers from various areas of the land development process give lectures about relevant topics that are usually not covered by the course lectures. The goal of guest lectures is to expose students to real-life examples as well as to strengthen the relationship between the building construction program and the industry. The following guest speakers are usually invited to speak on these topics:

- The faculty from the University Science Library gives a lecture on Geographic Information System, Maps and Imagery, and library research techniques.
- The Vice President of Land Acquisition and Development from a nationwide homebuilder gives a lecture on the land development process as executed in his company. He presents an example of the completed residential development project.
- The president of the local bank gives a lecture on financing residential developments.

- The president of the project management consulting firm involved in the various land development projects gives a lecture on commercial development and makes a comparison between commercial and residential development.
- The director of the local non-profit housing and development company gives a lecture about affordable housing.

Semester Capstone Project

A series of project assignments completed throughout the semester are gathered to create a final semester project. Students have approximately two weeks to work on each assignment. Students submit the assignment and prepare a Power Point presentation at the end of the two-week period. The instructor selects the project and site in order to accomplish the objective of the course which is to create a real-life situation for the site development project. Every semester the different real-life project located in the Gainesville area is given to the students. Therefore, it is a new project with unknown facts for the instructor, too. That requires continuous research and preparation for the instructor. The project is conducted in teams. The first step in the semester project is teambuilding. Students are required to take the Keirsey/Jung personality test to get an understanding of their personalities. Based on result of the test and the educational background, the instructor forms teams of three members. After the teams are formed, decisions about roles and responsibilities for each team member are made. Since land development is a multidisciplinary process, the idea was that each team member would cover different aspects of land development as well as take different roles in the team, such as leader, project manager, financial manager, sales representative, etc. The teams usually consist of one building construction student and two real estate students. Each team simulates one development company. The completion of the semester project requires significant commitment from both students and instructor. This is a capstone course for the building construction students and for all other students coming from various disciplines a graduate course, so that may justify the amount of work that they need to put into this course. Also, working in teams helps in distributing the responsibilities and decreasing the amount of work for which one person is in charge.

The semester project consists of 11 assignments:

1 - Pre-Qualification and Marketing: Students prepare an introductory letter to the owner highlighting their firm's expertise. The pre-qualification statement for their company is attached to the introductory letter. Students also prepare the first 10-minute presentation to market their company.

2 – Site Plan and Regulatory Environment: Students design a preliminary site plan for the development. Students can use any CAD software to draw the site plan. They ensure that the site plan is consistent with land use, zoning, subdivision ordinances, and the survey plan, as well as other regulations enforced by the city, county, Water Management District, and state. A report on the project's site analysis is required. Students estimate the time and cost needed to obtain necessary approvals. Students also prepare a 10-minute Power Point presentation that addresses site constraints and the proposed preliminary site plan.

3 – Market and Feasibility Analysis: Students perform a market analysis of the project, including a discussion of the competing supply and the price of the units, which is to be affordable to the target market. Students discuss the following linkages of the site: schools and

school zones, shopping, local services, transportation, and insurance information. Students conduct a preliminary feasibility analysis of the project using actual land cost, a conceptual estimate for the entire project cost, and prices as determined by the market analysis.

4 – Land Development Cost Estimate: Students provide a detailed estimate of all work necessary to complete the land development portion of the project. This detailed estimate must have required quantities in all applicable Construction Specification Institute (CSI) divisions. Students can complete the estimate by using any estimating or spreadsheet software. Students also prepare a 10-minute Power Point presentation that addresses market and feasibility analysis and their land development cost estimate.

5 – Design of the Residential Unit: Students design one residential unit that would be constructed in the development based on their preliminary site plan. Students need to draw their own construction plans by using any CAD software. They submit floor plans, two elevations, and a detailed site plan. Also, a description of the residential unit that serves as their specifications is required.

6 – Detailed Estimate and Project Feasibility: Students complete a detailed estimate of all work necessary to complete the construction of one residential unit. This detailed estimate must have required quantities in all applicable CSI divisions. Students can use any estimating or spreadsheet software. They examine the plans and estimates and identify opportunities for cost savings in the design and construction of the units. A feasibility analysis of the project, using actual land cost, the detailed project cost estimates, and prices as determined by the market analysis, is required.

7 – Cost-Loaded Project Schedule and Line-of-Credit Analysis: Students are required to prepare a computer generated cost loaded schedule for the land development and for the residential unit. Based on the absorption schedule from the market analysis, students develop a phasing plan for the construction of units. Students prepare the cost report, detailed by activity, and the cumulative cost curve. Based on a payment cycle, students draw a graphic on the cumulative cost curve of the early schedule to determine the maximum line of credit required for the project as conceptually scheduled. Students prepare a 10-minute Power Point presentation that addresses the design/drawings, detailed estimate, project feasibility, project schedule, and line-of-credit analysis.

8 – Contract Stage: Students are required to put together a contract package for the owner. The packet needs to include a completed contract document, a detailed cost-loaded schedule, performance and payment bonds, a schedule of values, and the final project drawings. The packet also includes the final version of the detailed estimate for their project. Students prepare product submittals for the mechanical, electrical and plumbing items and for the appliances for one residential unit.

9 – Request for Payment: Students prepare the payment requests for the project for the first three pay periods. They provide a cost-loaded curve and project schedule to validate their payment request. Also, students provide a release of liens as if they were handing the release of liens to the owner with the payment application.

10 – Change Order Stage: Students respond to a change requested by the owner with all proper management actions for that change. Students include the contract change order documents, change order cost estimates, revised schedules, and revised drawings. Also, a brief report that outlines the students' strategy for approaching this situation is requested.

11 – Project Closeout/Substantial Completion: Students are asked to write a letter of substantial completion to the owner with all the necessary attachments. Also, students write a

letter to the owner requesting payment of all retainage held during the project with all the necessary attachments.

The final report for the semester project is a collection of these eleven assignments.

Students' Presentations

Students are required to present their work to the instructor and their peers four times during the semester (as explained in the section *Project Description, Assignments 1, 2, 4, and 7*). The goals of these presentations are to strengthen students' communication skills and to challenge students to learn how to select the most important information to be presented in only a 10-minute time period.

The final presentations of the students' projects are scheduled for the end of semester. Students have a 10-minute period to present highlights of their projects. The instructor does not request any particular content or structure for the presentations. The goal is to encourage students to create the presentations based on their decisions of what the successful final presentation of the semester project would be. However, most teams prepare Power Point presentations that include the background information about the project, results of the market study, site design, typical residential unit design, project expenses estimate, project revenue and profit estimate, project feasibility analysis results, and total time needed for project completion. All students/team members are required to participate in the presentations.

Field Trips

The following field trips are usually organized during the semester:

- A visit to the site used for the semester project: The goal is to become familiar with the site and investigate the site characteristics and the characteristics of the surrounding properties. Based on the site visit, students can partially complete the site analysis.
- A visit to the First Step Center: The First Step Center is the City of Gainesville's permit and development assistance center. The center provides a convenient, one-step location where developers receive development and permit information from several city departments at one time. The appointment with the First Step Center is made in the same way as any other regular client. During this meeting, students learn about building permits, the availability of utilities at the site, sign regulations, parking requirements, transportation issues, comprehensive plan uses, fire safety requirements, zoning regulations, and stormwater management and environmental protection requirements. The information obtained during the first step meeting helps students complete the site analysis and design of the site.

Instructor Assessment of Students

To assess students' performance in the class, the following criteria are used:

- Class Participation (attendance, quizzes, short essays) 10%
- Test 1 10%
- Test 2 10%
- Final exam 10%
- Project Assignments 60%

The biggest challenge for the instructor is grading the project assignments. The grading criteria are developed for each assignment at the reasonable level of detail. Students are given these grading criteria in advance so while they are completing their assignments, they know what to pay attention to. The instructor reviews the drafts of the assignments, too and provides verbal feedback, usually during the lab held one class before the assignment is due. This method has proven to be very useful in improving the quality of the submitted assignments. Assignments are graded after each particular submission. Assignments must be corrected and submitted again at the end of semester as a part of the semester project report. This helps students to identify the mistakes in their projects and to learn by correcting those mistakes for the final submission.

Grading the semester capstone project as a team-based project is also a challenge. In each analyzed semester, one team complained about one team member not contributing equally to the project. To avoid this kind of problem and encourage students to share their responsibilities equally, students are required to submit the peer evaluation at the end of semester. They need to evaluate their team members and to evaluate themselves, too. The peer evaluation is included in the final project grade. The instructor has noticed that students have been honest in their evaluations. For example, two students who did not contribute equally to the completion of the project (compared to their team members), gave themselves a grade lower than the grade they assigned to their teammates.

Students' Evaluation of the Delivery System

A survey was conducted to obtain the students' opinions about the course in the Spring 2006 and Fall 2006 semesters. A questionnaire was created to evaluate the proposed delivery system. In the evaluation of the course, students used the grading scale from 1 to 5 (1 being the lowest grade and 5 being the highest grade). In Spring 2006, the class consisted of 20 students; 19 of these students answered the questionnaire. In Fall 2006, the class consisted of 19 students; 13 of these students answered the questionnaire. The surveys were conducted anonymously. Results of the students' evaluations are shown in Table 1. In columns 1-5, that is, Grading Scale for the Answers, the results are expressed by the values of the frequency of responses, that is, the percent of the students that gave the particular grade for the specific question. One hundred percent corresponds to the total number of students that answered the questionnaire. Values given in the column Mean Response represent the average values of the grades obtained for the specific questions in the particular semester.

Table 1. Results of the students' evaluations

Questions	Grading Scale for the Answers					no ans	Mean response	Sem.
	1	2	3	4	5			
1 After completing this course, how would you rate your understanding of the multidisciplinary aspect of the land development process?	0.0 0.0	5.3 0.0	42.1 7.7	26.3 61.5	26.3 30.8	0.0 0.0	3.74 4.23	S 06 F 06
2 After completing this course, how would you rate your understanding of the complexity of the land development process?	0.0 0.0	5.3 7.7	21.1 7.7	36.8 53.8	36.8 30.8	0.0 0.0	4.05 4.08	S 06 F 06
3 After completing this course, how would you rate your awareness of the different roles and responsibilities of the parties involved in the land development process?	0.0 0.0	0.0 0.0	15.8 0.0	52.6 61.5	31.6 38.5	0.0 0.0	4.16 4.38	S 06 F 06
4 After completing this course, how would you rate your understanding of the total building process?	0.0 0.0	21.1 0.0	21.1 38.5	31.6 38.5	26.3 15.4	0.0 7.7	3.63 3.54	S 06 F 06
5 After taking this course, how do you evaluate improvement of your real estate/construction vocabulary?	0.0 7.7	15.8 0.0	21.1 53.8	42.1 30.8	21.1 7.7	0.0 0.0	3.68 3.23	S 06 F 06
6 At what level did the course encourage active/constructive/self-learning?	0.0 0.0	0.0 7.7	42.1 23.1	21.1 53.8	36.8 15.4	0.0 0.0	3.95 3.77	S 06 F 06
7 At what level did the course encourage independent and critical thinking?	0.0 0.0	5.3 0.0	42.1 30.8	31.6 61.5	21.1 7.7	0.0 0.0	3.68 3.77	S 06 F 06
8 How did class presentations help in improving your communication skills?	5.3 0.0	21.1 0.0	31.6 23.1	31.6 46.2	10.5 30.8	0.0 0.0	3.16 4.08	S 06 F 06
9 How did working in teams help in improving your communication skills?	5.3 0.0	26.3 7.7	31.6 30.8	21.1 53.8	15.8 7.7	0.0 0.0	3.16 3.62	S 06 F 06
10 How did working in teams help in improving your teamwork skills?	0.0 0.0	21.1 7.7	26.3 30.8	31.6 53.8	21.1 7.7	0.0 0.0	3.53 3.62	S 06 F 06
11 How do you feel about the learning achieved by sharing the knowledge with your teammates?	5.3 0.0	21.1 0.0	15.8 30.8	42.1 61.5	15.8 7.7	0.0 0.0	3.37 3.77	S 06 F 06
12 Did the semester project (assignments 1-11) simulate real-life situations in the land development environment?	0.0 0.0	10.5 7.7	47.4 38.5	21.1 46.2	21.1 7.7	0.0 0.0	3.53 3.54	S 06 F 06

Table 1. Results of the students' evaluations (cont.)

Questions	Grading Scale for the Answers					no ans	Mean response	Sem.
	1	2	3	4	5			
13 How did the lectures help in your learning of the course material?	15.8 0.0	42.1 7.7	21.1 46.2	5.3 38.5	15.8 7.7	0.0 0.0	2.47 3.46	S 06 F 06
14 How did the semester project (assignments 1-11) help in your learning of the course material?	5.3 0.0	10.5 0.0	31.6 30.8	26.3 46.2	21.1 23.1	5.3 0.0	3.42 3.92	S 06 F 06
15 How did the guest lectures help in your learning of the course material and understanding of the real-life situations?	10.5 0.0	10.5 0.0	42.1 15.4	15.8 61.5	21.1 23.1	0.0 0.0	3.26 4.08	S 06 F 06
16 How did the field trips help in your learning of the course material and understanding of the real-life situations?	5.3 0.0	21.1 7.7	31.6 15.4	21.1 38.5	21.1 30.8	0.0 7.7	3.37 3.69	S 06 F 06
17 How would you rate helpfulness of taking the Keirsej-Jung personality test in the teambuilding process?	47.4 0.0	26.3 30.8	10.5 23.1	10.5 30.8	5.3 15.4	0.0 0.0	2.00 3.31	S 06 F 06
18 In this course, you were required to complete the semester project without direct help of instructor. How would you rate helpfulness of this approach for improving your independent thinking and learning?	5.3 0.0	5.3 7.7	26.3 7.7	31.6 76.9	26.3 7.7	5.3 0.0	3.95 3.85	S 06 F 06

Discussion of the Results of the Survey

In an analysis of the results of the survey, the following tasks were performed:

- Evaluation of the frequency of responses.
- Evaluation of the mean response value.
- Comparison of the frequency of responses for Spring 2006 and Fall 2006.
- Comparison of the values of the mean response for Spring 2006 and Fall 2006.

In this analysis, the grade values of 4 and 5 are considered positive, 3 neutral and 1 and 2 negative. The results of the students' evaluation were very helpful for the instructor because the results showed which parts of the delivery system were satisfactory and which parts needed improvement (from the students' point of view). The students' evaluations showed the following results:

1. 53% of the students in Spring 2006 and 92% of the students in Fall 2006 got an understanding of the multidiscipline aspect of the land development process by completing this course. In Fall 2006, the frequency of the positive responses increased by 39%, while the value of the mean response increased by 0.5 obtaining the value above 4. The instructor expected the students' outcome responses to question 1. These responses were noteworthy because they showed that students understood the multidiscipline aspect of the land development process.
2. 74% of the students in Spring 2006 and 85% of the students in Fall 2006 got an understanding of the complexity of the land development process by completing this course. The mean response had the value above 4 in both semesters. The instructor expected the students' outcome responses to question 2. These responses were noteworthy because they showed that students understood the complexity of the land development process. The increase of the mean response value by 0.03 and the increase of the frequency of the positive responses by 11% showed the improvement in the students' understanding of the complexity of land development in Fall 2006 compared to Spring 2006.
3. 84% of the students in Spring 2006 and 100 % of the respondents in Fall 2006 became aware of the different roles and responsibilities of the parties involved in the land development process by completing this course. The mean response had the value above 4 in both semesters. The results were significant because they showed that students were aware of the different roles and responsibilities of all parties involved in this process, and the interdependence of the different disciplines in the development. The frequency of the positive responses increased by 16% and the mean response increased by 0.22 in Fall 2006 compared to Spring 2006. These results showed that the students' understanding of the different responsibilities of the parties in the land development process improved in Fall 2006.
4. In Spring 2006, 21% of the students thought they did not obtain an understanding of the "total building process" after completing this course. However, 58% of the students felt that they got the understanding of the "total building process". In Fall 2006, 54% of the students thought they understood the "total building process", while 38 % of students gave the neutral response. The values of the mean response were between 3.5 and 4 in both semesters. The instructor did not expect that 21% of the class would not get an understanding of the "total building process" in Spring 2006 semester. The instructor assumed that the reason for these responses could be that the course was designed with the emphasis on the building construction aspect of the land development. It was perhaps difficult for the real estate students to understand the construction part of the process, which included estimating and scheduling. These results were significant for the instructor because they showed that more emphasis should be given to the areas that were completely new for the real estate students. In Fall 2006, the instructor added lectures and handouts/readings related to the concepts of estimating and scheduling to provide the basic background knowledge in these areas to the real estate students. However, in Fall 2006, the frequency of positive responses to question 4 decreased by 4% compared to those in Spring 2006. The frequency of neutral responses increased by 17%, while there were not any negative responses in Fall 2006 after adding the new lectures. The mean response decreased in Fall 2006 by 0.1 compared to Spring 2006. These results were noteworthy because they showed that the implemented teaching methodology is still not

efficient enough for the students in obtaining the understanding of the “total building process”. This will help the instructor in rethinking/redesigning the methods used to accomplish this course objective.

5. In Spring 2006, 63% of the students said that their real estate/construction vocabulary improved by taking this course. In Fall 2006, 54% of the respondents rated improvement of their real estate/construction vocabulary as average, while 38% felt that their vocabulary improved. The value of positive responses to question 5 decreased by 25% in Fall 2006 compared to Spring 2006. The values of the mean response were between 3.2 and 4 in both semesters. The mean response decreased in Fall 2006 by 0.5 compared to Spring 2006. The instructor expected that the students’ real estate/construction vocabulary improved by taking the course. However, the frequency of positive responses of 38% was not expected in Fall 2006. The instructor assumed the reason for these responses was that some of the real estate students were still not familiar with the construction terminology. These results were significant because they showed the instructor that additional literature, such as a construction dictionary, should be recommended in order to help real estate students build their construction vocabulary.
6. In Spring 2006, 58% of the students felt that the course encouraged self-learning while in Fall 2006 69% of the students responded that self-learning was encouraged by the course. The values of the mean responses were between 3.7 and 4 in both semesters. The instructor expected the responses to question 6. These results were of great importance because they showed that the same learning methods that encourage self-learning should be used in the future. The increase in frequency of positive responses by 11% shows that the students’ understanding of the benefits of the self-learning method enhanced in Fall 2006 compared to Spring 2006.
7. 53% of the students in Spring 2006 and 69% of the students in Fall 2006 thought that the course encouraged independent and critical thinking. The mean response was between 3.7 and 4 in both semesters. The instructor expected these responses. These results were important because they showed that students were comfortable with the independent and critical thinking learning approaches. The increase in frequency of positive responses by 16% and mean response by 0.1 shows that the students’ understanding of the benefits of the methods that encourage critical thinking improved in Fall 2006 compared to Spring 2006.
8. In Spring 2006, 42 % of the respondents thought that class presentations helped in improving their communication skills, while 32% gave the neutral response. In Fall 2006, 77% of the students felt that presentations helped in improving their communication skills. The mean response was 3.16 in Spring 2006 and 4.08 in Fall 2006. The instructor expected the responses to question 8 in Fall 2006 but did not expect the responses in Spring 2006. However, the increase in frequency of positive responses by 35% and the mean response by 0.92 represents the increased appreciation of the class presentations in Fall 2006 compared to Spring 2006. These results were noteworthy because they showed that the class presentations should be used as a teaching/learning method in order to improve students’ communication skills.
9. In Spring 2006, 37% of the students thought that working in teams helped in improving their communication skills while 32% did not find teamwork useful. In Fall 2006, 61% of students felt the benefits of working in teams. The mean response was between 3 and 4 in both semesters. The responses in Spring 2006 were not expected. The instructor assumed

that reason for these responses was that some team members were not contributing equally to the project. As a result, the other team members were not satisfied with the communication in the team and teamwork in general. This assumption is based on the peer evaluations provided at the end of semester. The instructor expected the frequency of responses in Fall 2006. These results were significant because they showed that students preferred working in teams in Fall 2006. The frequency of positive responses increased by 24% while the mean response increased by 0.46 which shows that students understanding of the importance of teamwork for improving the communication skills increased. These results will guide the instructor in creating future team-based projects.

10. In Spring 2006, 53% of the students thought that working in teams helped in improving their teamwork skills. In Fall 2006, 62% of students responded that teamwork was beneficial for improving their teamwork skills. The mean responses were between 3.5 and 4 in both semesters. The responses to the questions related to teamwork were expected. These responses were significant because they showed that students prefer working in teams. Also, the increase in frequency of positive responses by 9% and in mean responses by 0.1 in Fall 2006 compared to Spring 2006 showed that students awareness of the benefits of teamwork increased in Fall 2006. These results will lead the instructor in using team-based projects in future.
11. 58% of the students in Spring 2006 and 69% of students in Fall 2006 thought that working in teams helped in their learning of the course material. The mean responses were between 3.4 and 4 in both semesters. The responses to the questions related to teamwork were expected. These responses were significant because they showed that students prefer working in teams. Increase in frequency of positive responses by 11% and increase of the mean response by 0.4 showed that students appreciation of the teamwork as an useful learning method increased. These results are noteworthy because they show the instructor that team-based projects should be used in the future semesters.
12. In Spring 2006, 47% of the students gave an average rating to the semester project regarding its simulation of real-life situations in the land development environment, while 42% thought that the project simulated the real-life situation. In Fall 2006, 54% of the students said that the project simulated the real-life situation, while 38% gave an average rating. The mean response was approximately 3.5 in both semesters. The instructor did not expect that students would not recognize the real-life character of the semester project in Spring 2006. The instructor assumed that the reason for these responses, as students commented several times throughout semester, was that the project was not feasible at all. Students expected that their project would be feasible, not realizing that the goal of the class was to exercise the feasibility analysis process and not necessarily make the project feasible. These results were significant for the instructor because they showed that the instructor should make the objectives of the project very clear to the students and explain that not every project in the real world is feasible and that not every project is pursued in the real world. The frequency of positive responses increased by 12% in Fall 2006 compared to Spring 2006, showing that students understood the fact that not every project is feasible and that the course objective is to comprehend/exercise the feasibility analysis process.
13. In Spring 2006, 58% of the students thought that the lectures did not help in their learning of the course material while 21% of the respondents felt the benefits of the lectures. In Fall 2006, 46% of the students felt that lectures were useful for their learning while 46%

of the students were neutral. The mean response was 2.5 in Spring 2006 and 3.5 in Fall 2006. The responses to question 13 were not expected. The instructor assumed that the reasons for these responses were similar to those for question 4. The real estate students felt a lack of sufficient lectures related to the building construction area, such as estimating and scheduling. These results were of great importance because they led the instructor to the decision to add the lectures on estimating and scheduling in Fall 2006. The instructor assumed that this was the reason for the increase in frequency of positive responses by 25 % and the mean response by 1 for the question about the usefulness of the lectures in Fall 2006.

14. In Spring 2006, 47% of the students found the semester project helpful in their learning of the course material while 32% had the neutral opinion. In Fall 2006, 69% of the students felt that the semester project was useful for their learning, and 31% expressed the neutral opinion. The mean response was between 3.4 and 4 in both semesters. The instructor expected these answers. The increase in frequency of positive responses by 22% and in the mean response by 0.5 showed that the students in Fall 2006 got the understanding of the benefits of the semester project for their learning. These responses were significant because they showed that the semester project was a useful teaching/learning method and should be applied in the future.
15. 37% of the students in Spring 2006 thought that the guest lectures helped in their learning of the course material, while 42% expressed the neutral opinion. In Fall 2006, 85% of the respondents recognized the benefits of the guest lectures for their learning. The mean response was 3.3 in Spring 2006 and 4.1 in Fall 2006. The instructor did not expect these answers in Spring 2006. However, in Fall 2006, the frequency of positive responses increased by 48% and the mean response by 0.8, reaching the positive values. The Fall 2006 responses were significant because they showed that the guest lectures should be used as a teaching method in the future.
16. In Spring 2006, 42% of the students thought that the field trips helped in their learning of the course material and creating the real-life situation while 32% had the neutral opinion about the field trips. In Fall 2006, 69% of the students felt the benefits of field trips. The mean response was between 3.4 and 4 in both semesters. The instructor did not expect the answers in Spring 2006. The increase in frequency of positive responses by 27% and the mean response by 0.4 in Fall 2006 showed that students understood the benefits of the field trips in Fall 2006 compared to Spring 2006. These responses were noteworthy because they showed that the field trips were a helpful teaching/learning method that should be used in the future.
17. In Spring 2006, 74 % of the students did not find that taking the Keirsey-Jung personality test was helpful in the team building process. In Fall 2006, 46% of the students thought that taking the Keirsey-Jung personality test helped in the teambuilding process, while 31% did not find this test helpful for the teambuilding. The mean response was 2 in the Spring 2006 semester and 3.3 in the Fall 2006 semester. The instructor expected that students would think that taking the Keirsey-Jung personality test would help in the teambuilding process. However, in Spring 2006, only 15% of students thought this approach was helpful. The instructor noticed that students in that particular class preferred to select their teammates based on their personal connections rather than their instructor's suggestions or their educational background and personalities. The instructor assumed that these were the reasons for the unexpected responses to question 17 in

Spring 2006. The increase in frequency of positive responses by 31% and the mean response by 1.3 in Fall 2006 compared to Spring 2006 encouraged the instructor to continue to use the Keirsey-Jung test in the teambuilding process.

18. 58% of the students in Spring 2006 and 85% of the students in Fall 2006 thought that the completion of the semester project without direct help of the instructor was useful for improving their independent thinking and learning. The mean response was between 3.8 and 4 in both semesters. The instructor expected these responses. The increase in frequency of positive responses by 27% in Fall 2006 compared to Spring 2006 showed the instructor that the critical thinking/independent learning approach should be applied in the completion of the semester project in the future.

Conclusions and Future Research

The delivery system applied in the Project Planning and Feasibility/Site Development course and explained in this paper can be used as a possible reference for developing real estate development courses in other building construction programs. The course introduces students to not only the construction management part of residential real estate development but also to the activities happening before and after the construction. This helps students understand the complexity of the land development process. Taught as a multidisciplinary course, this course builds students' appreciation of all disciplines involved in the land development process. This capstone course also integrates and applies all knowledge that students accumulated in their previous education in the building construction program. Students experience a real-life environment in this course by working on a real semester project. The building construction students prefer hands-on activities. Therefore, the students were motivated to work on the real-life projects in the Gainesville area and to apply all their knowledge in a comprehensive manner to complete the capstone project. Teamwork is a required method of completing the semester project. It helps students build teamwork abilities and communication skills. The course method also encourages critical thinking and self-learning. A course requirement is the use of various software to complete the project. This requirement helps in improving students' computer skills.

The survey was conducted to obtain the students' opinions about the course delivery system. The survey results showed the students' satisfaction with the delivery system. Based on the students' opinions, the areas that need modification are: obtaining the understanding of the "total building process", building construction vocabulary, understanding the usefulness of the Keirsey-Jung personality test, recognizing the real-life character of the semester project, and improving the quality of lectures. The survey results improved in Fall 2006 compared to Spring 2006. The survey results will guide the instructor in continuing application of the teaching/learning methods that got the positive students' evaluations and in improving the delivery system in the areas that got negative students' evaluations.

The results of the students' evaluation survey do not differ significantly from the instructor's opinions about the effectiveness of the delivery system and the course. The instructor found that more focus needs to be given to the following areas: comprehensive explanation of the "total building process", improvement of the lectures, introducing building construction/real estate terminology/vocabulary, explaining the benefits of using the Keirsey-Jung personality test, and

enhancing the constructive learning environment which promotes self-learning, independent thinking and teamwork. Besides these methods that require improvement, the instructor finds the remaining teaching methods useful and effective in accomplishing the course objectives. The quality of the completed semester projects and knowledge that students demonstrate in the tests show that students learn the course material, get an understanding of real estate principles, complexity and multidisciplinary aspect of real estate development, responsibilities of various parties, and build the construction/real estate vocabulary. A good general knowledge about the real estate process with respect for the various disciplines in this process, as well as teamwork skills and communication skills, provide an important basis for success in the construction industry.

The instructor will continue to use the survey to obtain the students' opinions about the course in future semesters. However, the comments by the reviewers for the ASC 43rd International Conference Proceeding and the instructors' observations can be used to improve the survey in the future. The question about the demographics of the respondents can be added to the survey and will give better information about the differences between the responses from the students from the various disciplines, such as building construction and real estate. Also, some questions in the survey were concerned about the encouragement of students learning from various teaching methods. The questions about the benefits of the method for student learning instead of encouragement would give a better picture of the effectiveness of the particular method.

The students' evaluation survey results, the instructor's observations, the quality of the students' work, and the students' performance assessment can help the instructor to further enhance the quality of the delivery system for this course.

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